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ALGEBRA 1 COMPUTER WORKSHEET NON-LINEAR GRAPHS

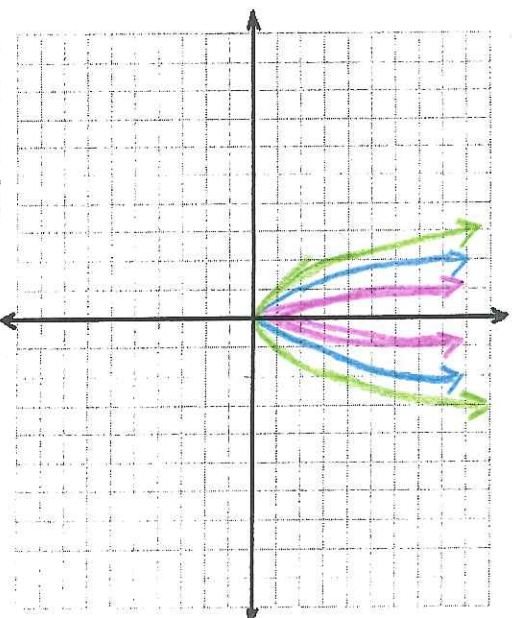
SLOPE

1. Sketch all 3 graphs on the same axes.
(color coding with key!)

$$Y = x^2$$

$$Y = 2x^2$$

$$Y = 8x^2$$



Generalize: When the x^2 is multiplied by a ^{coefficient larger} than one, then the graph will become more narrow.

2. How do you think you might get the graph to be flatter?
Experiment with several options. When you discover the answer, give 3 equations that are flatter and make a generalization.

$$Y = .1x^2$$

$$Y = .05x^2$$

$$Y = .001x^2$$

Generalize: When the x^2 is multiplied by a ^{coefficient less than 1} greater than 0, then the graph will become more flatter.

3. How do you think you might get the graph to be upside down?

Generalize: When the x^2 is multiplied by a negative, then the graph will go upside down.

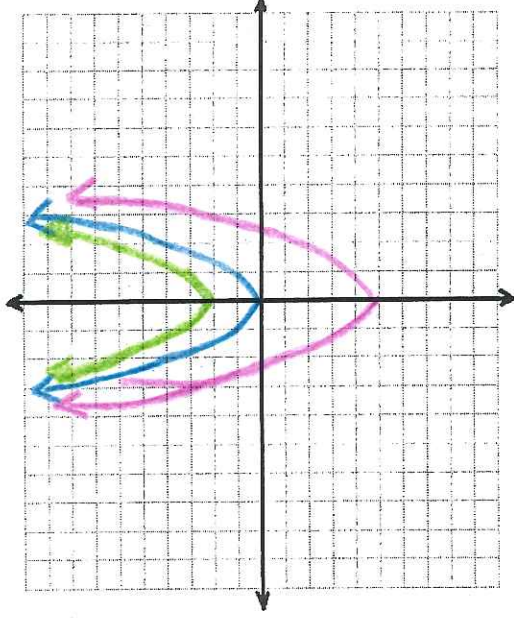
TRANSLATION

4. Sketch all 3 graphs on the same axes

$$y = x^2 \text{ —}$$

$$y = x^2 + 2 \text{ —}$$

$$y = x^2 - 5 \text{ —}$$



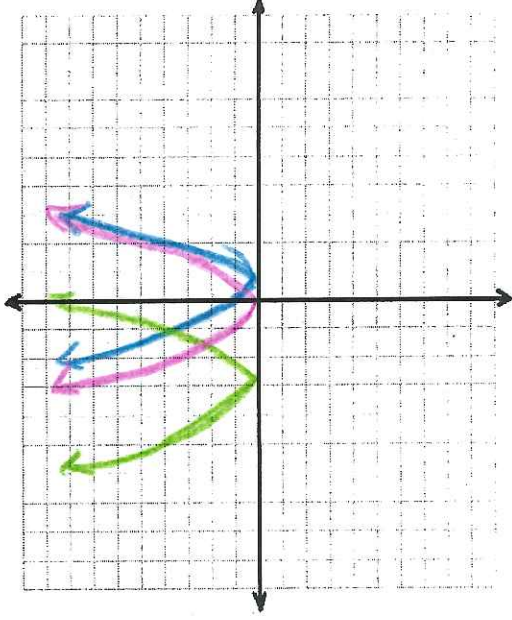
Generalize: When you add to x^2 , the graph will translate up that many units
When you subtract from x^2 , the graph will translate down that many units

5. Sketch all 3 graphs on the same axes

$$y = x^2 \text{ —}$$

$$y = (x + 3)^2 \text{ —}$$

$$y = (x - 1)^2 \text{ —}$$



Generalize: When you add to x in the parenthesis, the graph will

move to the left that many units

When you subtract from x in the parenthesis, the graph will

move to the right that many units.

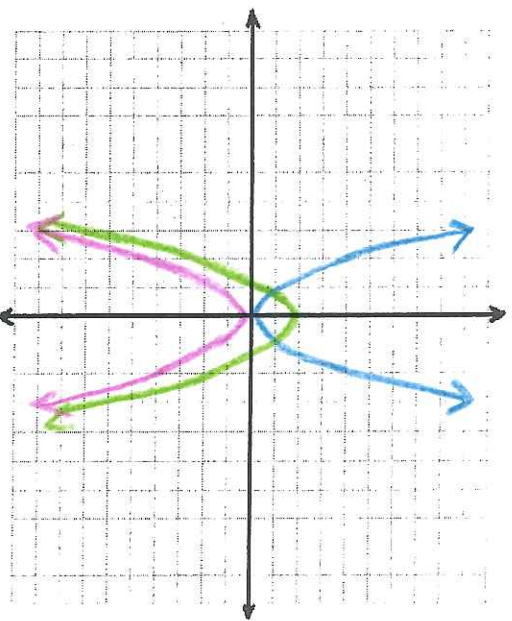
REFLECTIONS

6. Sketch all 3 graphs on the same axes

$$y = x^2$$

$$y = -x^2$$

$$y = -x^2 + 2$$



Generalize: When a is positive, the graph will be minimum.
When a is negative the graph will be maximum.

Using all the generalizations that you made above, can you:

1. Write a quadratic equation for a graph that has a minimum at the point of $(0, -2)$ and is flatter than $y = x^2$?

$$y = \frac{1}{2}x^2 - 2$$

2. Write a quadratic equation for a graph that has a maximum at the point of $(0, 5)$ and is thinner than $y = x^2$?

$$y = -2x^2 + 5$$

3. Write a quadratic equation for a graph that has any vertex at the point of $(4, -2)$?

$$y = (x - 4)^2 - 2$$

4. Write a quadratic equation for a graph that has a maximum at $(-2, 0)$?

$$y = -(x + 2)^2$$

